



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 34

SUBJECT:- SCIENCE

CLASS: VI

CHAPTER : SEPARATION OF SUBSTANCES

Week : 21st to 28th Jan. 2021

No. of blocks- 2 or 3

GUIDELINES FOR STUDENTS :

Dear Students

- Refer to the content given below and view the links.
- These notes will help you understand the concept and complete the assignment that follows.
- The assignment is to be done in the Science notebook.
- Please read Science NCERT book before you begin to answer the questions.
Chapter Link <https://ncert.nic.in/ncerts/l/fesc105.pdf>

SUBTOPICS:

1. What are mixtures?
2. Why do we need to separate mixtures?
3. Methods of separation

Instructional Aids /Resources:

1. Class 6 Science NCERT textbook
2. E-lesson
3. You-tube link

LEARNING OUTCOMES:

By the end of this E lesson each learner will be able to

- Tell the difference between a pure substance and a mixture.
- Give examples of mixtures from their everyday life
- Explain the need to separate various types of mixtures.

INTRODUCTORY ACTIVITY

Look around you and name the things which are there around you. You will realise that all of these are formed by combining various things and hence all are mixtures.

Look at the things shown below, These are all mixtures.



will you separate these mixtures which you find around you in everyday life ?

1. Different fruits from a fruit basket



2. Tea leaves from Tea



4. Sand from water

3. Stones from rice

5. Salt from salt solution

LESSON DEVELOPMENT

Pure Substances: Many substances around us contain only one type of constituent particles. Elements and compounds are pure substances. Some of the pure substances are iron, copper, distilled water, salt, etc.

Impure Substances: Substances containing more than one type of constituent particles are called impure substances. Some of the impure substances are tap water, milk, aerated drinks etc.

Impurities: These are the unwanted particles present in a substance making it impure like stones in rice, various salts in water etc.

Mixtures: Substances which contain more than one component mixed in any ratio are called mixtures. For example, air is a mixture of many gases like nitrogen, oxygen, carbon dioxide, dust particles, etc.



Need for Separation:

We carry out the separation of the components of a mixture or an impure substance with the following purposes:

- To remove the harmful component.
- To obtain the useful component.
- To remove impurities for getting a pure sample.

Principle of separation The substances present in a mixture retain their original properties like particle size, density, melting point, boiling point, volatility, etc.

We use the difference in any one of these properties in the components of a mixture to separate them.

Common methods Of Separation

Handpicking

Threshing and winnowing

Churning

Evaporation

Sieving

Filtration

Magnetic separation

Hand-picking:

Rice, wheat, pulses, etc., that we buy from the market may contain impurities (unwanted or harmful particles) in the form of small stones, unwanted grains, etc. Often, these impurities look very different from the food item and can be spotted easily. The method of separation used in such a case is hand-picking. This method is preferred when

- the quantity of the mixture is small,
- the unwanted substance is present in smaller quantities, and

- the size, shape, or colour of the unwanted substance is different from that of the useful one.



Threshing:

Grains or seeds of plants like rice and wheat serve as sources of food. The flour (atta) that is used for making chapattis is made from wheat grains. After these crops have been harvested or cut, the grains need to be separated from the stalks (the dried stems). This is done by threshing.

The process of beating harvested crops to separate the grains from the stalks is called threshing. It is done manually (by hand) or with the help of machines. Manual threshing is done by holding a pile of crop and beating it on a rock or a hard surface. This loosens and separates the grain from the stalk. Sometimes, threshing is also done by crushing the harvested stalks using bullocks.



Threshing is also done with the help of machines like the combine harvester. Threshed grains may still contain seed coverings and tiny pieces of leaves or stem (collectively called chaff). These are separated by winnowing.

Winnowing:

The method used to separate chaff from the grain by wind or blowing air is called winnowing.

The mixture of chaff and grain is taken in a winnowing basket. The farmer stands at a higher level and lets the mixture fall to the ground.

The grain, being heavier, falls almost vertically whereas the lighter chaff is carried away by the wind and forms a separate heap away from the grain.

The separated chaff is used as fodder for cattle. The direction of the wind plays an important role in the process of winnowing.



Sieving:

If the components of a mixture are of different sizes, they can be separated by sieving. The smaller component passes through the pores of the sieve whereas the larger component (stones or husk) is left behind in it. This method is used in some homes to separate wheat bran (the bigger particles) from flour.

However, sieving wheat flour is not advisable as wheat bran, which is removed during sieving, is very rich in nutrients and is also a rich is better to remove visible impurities by hand picking.

The process of sieving is also used to separate pebbles and stones from sand at construction sites. The stones and pebbles present in the mixture remain in the sieve and the fine sand particles pass through the holes of the sieve.



Watch the video for understanding various methods of separation.

<https://www.youtube.com/watch?v=hGkc2BqhPEo>

Sedimentation and Decantation:

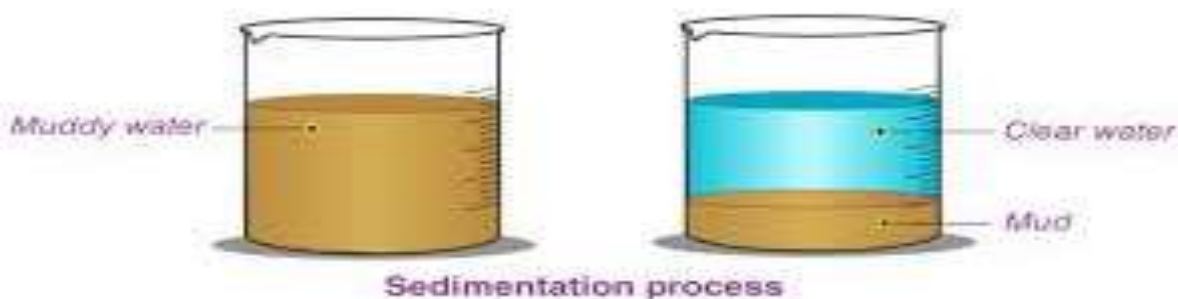
Have you seen pulses being washed in your home? When pulses are kept in a bowl of water, they settle down as they are heavy. However, dirt, insects, tiny pieces of straw, and other lighter impurities float at the top. The water, which contains these impurities, is then poured out and discarded. This process involves two methods: sedimentation and decantation. The process of separating insoluble solids, suspended in a liquid, by allowing them to settle down is called **sedimentation**. The solid particles that settle down during sedimentation are called **sediments**. The process of pouring out the clear upper liquid without disturbing the sediments is called **decantation**.

The liquid above the sediments is called a **supernatant**.

A mixture of sand and water can also be separated by sedimentation and decantation.

The mixture is left undisturbed for some time.

Sand, being heavier, settles down and water is poured out into a separate container.



Watch this video for understanding Sedimentation and decantation

https://www.youtube.com/watch?v=seFuFG_x-b8



Make a water filter of your own.

Procedure: Cut the bottom of a plastic bottle about two inches from the bottom. Turn the bottle upside down and put cotton fine sand, charcoal and gravel in it as shown in the figure. This becomes the filter. Pour dirty water on top of the sand in the bottle. Watch the water seep through the sand and gravel. Check out the water collected in the glass.

The layers of sand and gravel help in removing the dirt from the water. The water is now clear water devoid of various impurities. Charcoal will remove any colouration or odour.

Please note that this water is not fit for drinking.

<https://www.youtube.com/watch?v=fe9axlzBkgk>





What you have done in this activity is that you have separated various impurities from dirty water and obtained clear water. The dirty water is an example of a mixture from which you have separated the impurities using a simple method.



We know that water is purified before it is supplied to our houses. Then why do we have water filters installed in our houses? What purpose do they serve? Find out.

ASSIGNMENT

- 1. Give two examples each of mixtures and pure substances that we come across in our daily life.**
- 2. Why salt is a pure substance and salt solution is considered to be a mixture?**
- 3. Define the following:**
 - a. Mixture**
 - b. Threshing**
 - c. Winnowing**
 - d. Sedimentation and decantation**
- 4. What is the basis of using handpicking as a method of separation?**